Impact of Convergence Bidding on Interties

Revised Straw Proposal

June 10, 2011

Impact of Convergence Bidding on Interties

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1 Introduction

In April 2011, the ISO established two stakeholder initiatives to resolve issues resulting from convergence bidding at the interties. The first, the Redesign of the Real-Time Imbalance Energy Offset, sought to address bidding patterns that result due to the price differential between the Hour-Ahead Scheduling Process (HASP) price for interties and the Real-Time Dispatch (RTD) price for internal generation and load. The second, Price Inconsistency Caused by Intertie Constraints, sought to address instances where physical imports and exports may clear inconsistent with their bid price. The proposed solutions vetted through both stakeholder initiatives have not resulted in broad stakeholder support for any of the options. In addition, stakeholders and the ISO have not been able to identify alternative options that address identified issues without creating new market efficiency issues or reliability concerns.

The current market design for convergence bidding has a structural disconnect between the liquidation of virtual supply/demand and the establishment of real-time binding settlement of locational marginal prices (LMP) of physical supply/demand. The current market design has three binding settlement LMPs for physical supply/demand (IFM, HASP for interties, RTD for internal generation/load), three binding settlement LMPs for virtual supply and demand (IFM HASP for interties, and RTD for internal nodes), but only two liquidation market optimizations for virtual supply and demand (IFM and HASP). By removing convergence bids at the interties, the market design will result in only one real-time settlement LMP for virtual bids and one day-ahead settlement LMP for virtual bids.

The revised straw proposal contains three elements to address the market issues identified in both stakeholder initiatives above:

- While the stakeholder process continues to address issues with convergence bidding on the interties, the ISO will retain the threshold for making an emergency filing of the proposed settlement rule;
- The ISO proposes to remove interties as eligible convergence bidding nodes under the current market design;
- The ISO proposes additional rules to deter implicit virtual bidding at the interties.

The full redesign of the real-time market (HASP and RTD) will continue to be addressed in the Renewable Integration: Market and Product Review Phase 2 stakeholder initiative.

2 Plan for Stakeholder Engagement

Item	Date
Post Revised Straw Proposal	June 10, 2011
Stakeholder Conference Call	June 17, 2011
Stakeholder Comments Due	June 24, 2011
Post Draft Final Proposal	July 1, 2011
Stakeholder Conference Call	July 14, 2011
Stakeholder Comments Due	July 21, 2011
Board Meeting	August 24-25, 2011

3 Issue with Convergence Bidding Liquidation and Settlement Timing

The current convergence bidding design liquidates virtual supply and demand during HASP, but the settlement prices for internal and intertie nodes occur at different timeframes. The liquidation of virtual supply/demand for internal nodes occurs prior to the RTD market optimization run which results in binding settlement LMPs for internal nodes. The liquidation of virtual supply/demand on the interties is aligned with the HASP market optimization run which results in binding settlement LMPs for the interties. Therefore, the current market design has three binding settlement LMPs for physical supply/demand (IFM, HASP for interties, RTD for internal generation/load), three binding settlement LMPs for virtual supply and demand (IFM HASP for interties, and RTD for internal nodes), but only two liquidation market optimizations for virtual supply and demand (IFM and HASP). Since virtual supply and demand are not liquidated during the same market optimization run as the binding settlement LMPs for internal nodes, the ability for virtual bids on the interties to drive convergence between HASP and RTD prices is not achieved.

The ISO has reviewed Powerex's proposal to address the premature liquidation of internal virtual supply and demand in HASP. In theory, if internal virtual supply and demand were not liquidated in HASP, but rather held until RTD for liquidation, convergence between IFM, HASP and RTD should be realized. However, holding internal virtual supply and demand until RTD would pose potential reliability risks given the importance of imports to the ISO meeting load. For example, assume there is net internal virtual supply, ISO operations would not be able to secure additional physical imports to replace the net internal virtual supply, but must only rely on internal generation. In periods of high load, ISO operations must have all internal and external resources available to meet ISO demand.

3.1 Comparison with NYISO Intertie Scheduling and Virtual Bidding

The New York ISO (NYISO) is the most relevant ISO/RTO for comparison with the ISO. Like the ISO, the NYISO is a large net importer of power and has an hour-ahead scheduling process similar to the ISO. However, the NYISO does not allow virtual bids at the interties or at individual internal nodes.

The NYISO schedules imports and exports in an hour-ahead process that is very similar to the ISO's HASP process. The NYISO process/software tool is called RTC. RTC initializes and runs every 15 minutes, looking forward nine 15 minute intervals in time. In addition to scheduling imports, RTC is used to commit quick start units, primarily 10 minute and 30 minute gas turbines. While RTC runs four times an hour, only one of the four runs is currently used to schedule imports and exports. This run is referred to as RTC15 and initializes at the top of the hour and posts 15 minutes after the hour, with schedules for the hour beginning roughly 45 minutes after posting.

If there is no congestion on the external interfaces in the RTC evaluation, RTC will schedule imports and exports, but the price used for settlements will be the real-time price at the relevant proxy bus, computed as the time weighted average real-time price. However, imports scheduled in RTC receive a bid production cost guarantee that if the real-time price is lower than their offer price, they will be paid their offer price. This introduces a potential pay-as-bid element into the market design that is not ideal, but concluded to be necessary to ensure the availability of import supply. The NYISO, like the ISO, is typically a net importer, and is particularly likely to be a net importer during high load conditions when imports may be important for reliably meeting load.

There is no price assurance for exports scheduled in RTC. If the real-time price turns out to be higher than projected in RTC and higher than the price bid by the purchaser for the export, the export buyer has to pay the real-time price for power. The rationale for the absence of any price guarantee is that the scheduling of exports does not benefit New York power consumers and hence there is no basis for them to bear any uplift costs associated with exports. Neither generators nor exporters have volunteered to bear uplift costs to make exporters whole, so there is no price assurance for export transactions.

The exception to interchange prices being determined in real-time is if the interface is constrained in RTC, so that the offer price of the marginal import is lower than the internal New York price (import constrained) or the bid price of the marginal export is higher than the internal New York price (export constrained). If a proxy bus is import constrained and the clearing price in RTC is lower than the real-time price, the import supplier is paid the RTC price, i.e. a price lower than the internal NYISO price. Conversely, if a proxy bus is export constrained the clearing price in RTC is higher than the real-time price, the export buyers pays the higher RTC price. Thus, congestion does not give rise to shortfalls and uplift but contributes to surpluses in the form of real-time congestion rents.

The NYISO does not allow virtual bids on the interties, but it should also be pointed out that the NYISO does not allow nodal virtual bidding at this time. All virtual supply and demand bids are cleared at zonal prices[1]. As a result, the market optimization for liquidating virtual supply and demand and determining internal zonal prices occur at the same timeframe. Since NYISO does not allow virtual bids on the interties, they do not have a timing disconnect similar to the ISO under the current convergence bidding design.

4 Redesign of Real-Time Imbalance Energy Offset

The ISO has been working on operational improvements to address the HASP and RTD price differentials. These efforts have resulted in a significant reduction in Real-Time Imbalance Energy Offset costs. With the reduction in the impact of convergence bidding to the Real-Time Imbalance Energy Offset, the ISO and stakeholders decided to look for intermediate solutions to the price differences between HASP and RTD.

If imports/exports and internal demand/generation were cleared in the same market, the divergence between HASP pricing and RTD pricing would not result in Real-Time Imbalance Energy Offset uplift costs. A comprehensive redesign of the real-time market, a longer term solution, is currently being addressed in the Renewable Integration: Market and Product Review Phase 2 stakeholder initiative.

The proposed solutions vetted through the prior revised straw proposal and subsequent stakeholder call has not resulted in broad support for any of the options. In addition, stakeholders and the ISO have not been able to identify alternative options that address identified issues without creating new market efficiency issues or reliability concerns.

4.1 Background

The Real-Time Imbalance Energy Offset (CC 6477) is a neutrality account through which the ISO tracks the settlement dollar values for the following charge codes: Real-Time Instructed Imbalance Energy (CC 6470), Real-Time Uninstructed Imbalance Energy (CC 6475), Real-Time Unaccounted for Energy (CC 6474), and the HASP Energy, Congestion and Loss Pre-Dispatch

[1] A simple training presentation of Virtual Trading in NYISO can be found at http://www.nyiso.com/public/services/market_training/online_resources/VirtualTrading/player.html.

(CC 6051), less the Real-Time Congestion Offset (CC 6774). The offset is allocated to all SCs based upon a pro rata share of their measured demand (i.e., metered load and exports) excluding the demand quantity for the valid and balanced portion of self-schedules related to transmission ownership rights in real-time and net measured demand of load following metered subsystems.[2] This may result in a payment or charge to SCs depending on the whether there is a surplus or deficit.

In 2009, the ISO conducted a stakeholder process to determine whether modifications to the current design of the allocation of the Real-Time Imbalance Energy Offset were appropriate and necessary. At that time, no clear alternative could be identified because causal attribution to specific market activity was not clear. At the conclusion of the stakeholder process, the ISO did not change fundamentally the allocation to measured demand, but clarified that for SCs for MSS Operators that have elected Load following, the ISO will not assess any charges or make payments for the resulting non-zero differences recovered through the offset. The ISO, however, committed to, and has since continued to work on, operational enhancements that would assist in the convergence of the HASP and RTD prices. The ISO also committed to revisit its prior conclusion if the dollar volume in the Real-Time Energy Offset Account increased substantially.[3]

As Figure 1 illustrates, from January 2010 through April 2011 the average monthly Real-Time Imbalance Energy Offset has been $11.7M. The offset peaked in June/July 2010 at over $20M and returned to levels consistent with the first half of 2010 in September 2010. Since September 2010, the offset has trended higher.

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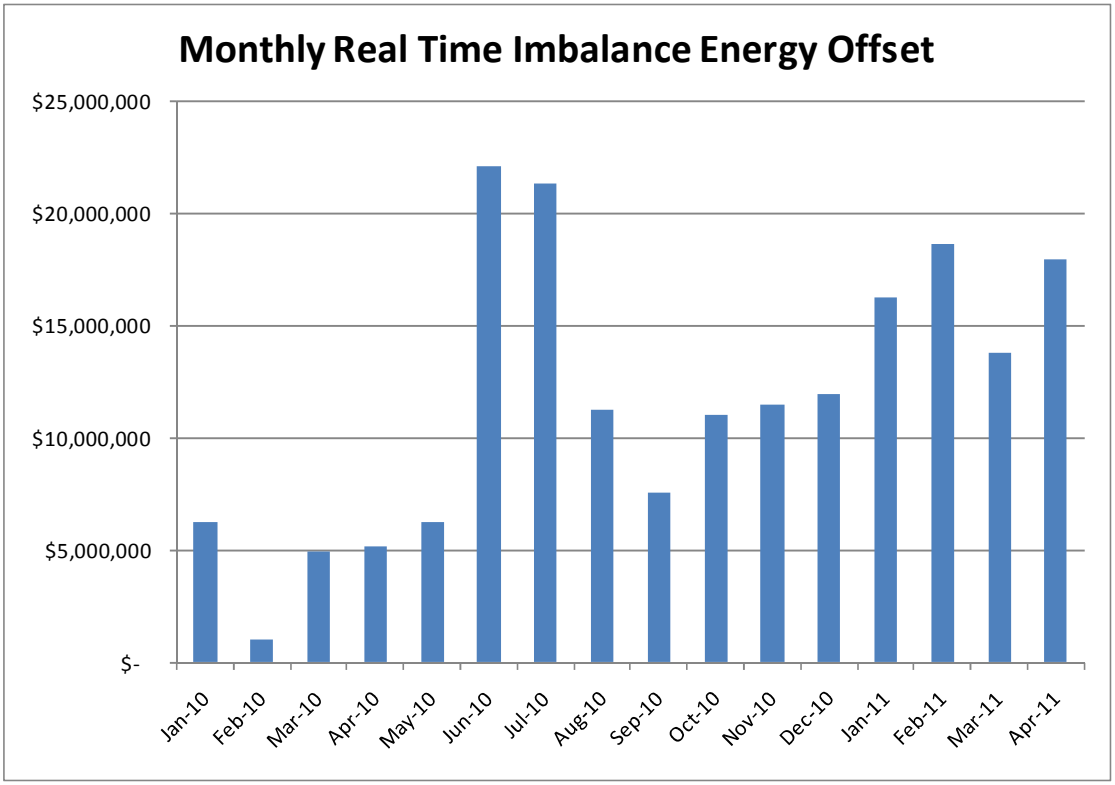
2 Additional documentation can be found in the Settlements & Billing BPM Configuration Guide available at https://bpm.caiso.com/bpm/bpm/version/000000000000085

3 Additional information on the prior stakeholder process is available at http://www.caiso.com/2406/2406e2a640420.html

Figure 1 – Monthly Real Time Imbalance Energy offset January 2010 through April 2011



Since July 2010, the ISO has implemented several market rules changes that impact the offset. First, as required by the ISO tariff, in April 2010, the energy bid cap was raised from $500/MWh to $750/MWh and in April of 2011, it was raised to $1,000/MWh. Because certain pricing parameters are tied to the energy bid cap, this has increased the level prices can reach in the real-time market when there are short-term imbalances in which the pricing parameters set the market clearing prices. The higher RTD prices impact the Real-Time Imbalance Energy Offset when the ISO is constrained to procure additional energy in RTD at the higher prices. The offset is the mechanism for settling the additional imbalances for energy that are not already allocated to instructed and uninstructed deviations from resources' day-ahead schedules. Depending on the condition, the Real-Time Imbalance Energy Offset can increase or decrease. However, because the bid floor remained unchanged at negative $30.00 combined with the lower frequency of negative prices, the relative impact of potential reductions in the offset when negative prices caused by over-generation situations occur (*e.g.,* when the HASP price is greater than RTD) is not symmetric and does not balance the effect of the real-time offset when RTD prices are higher than the HASP price.

Another important market rule change was the ISO's implementation of convergence bidding in February 2011, which allows market participants to take virtual supply and virtual demand positions in the day-ahead market at interties, load aggregation points, trading hubs and individual pricing nodes. With the introduction of convergence bidding, market participants are able to hedge price differences between the day-ahead and real-time market. Virtual positions at the intertie are liquidated in HASP and settled at the relevant HASP LMP in the same way as any changes in physical intertie schedules in HASP are settled based on the relevant HASP LMP. Virtual positions on eligible pricing locations internal to the ISO are liquidated in HASP and settled at the real-time relevant LMP. Any differences in the HASP and RTD price affecting

the offsetting volume of virtual position on interties and internal locations will affect the real-time energy offset.

Since the start of the ISO LMP-based market in 2009, prices set in the HASP have historically been lower than those observed in RTD[4]. While there are several potential reasons for this, the difference is often driven by modeled and forecasted imbalance condition differences as well as having small quantities of short-term ramping capability available to accommodate such changes in imbalance conditions.

The persistent average price differential between HASP and RTD has encouraged the use of internal virtual demand bids, which has corresponded with an increase in the Real-Time Imbalance Energy Offset. Prior to implementation of convergence bidding, market participants could not bid to arbitrage price differentials between HASP and RTD caused by market participants that were not allocated the Real-Time Imbalance Energy Offset because only load serving entities (LSE) could bid internal demand, and virtual demand bids were non-existent. With the commencement of convergence bidding, market participants that do not serve load now can combine an internal virtual demand bid and an intertie physical/virtual supply bid at the same price and quantity, which in essence allows the market participant to arbitrage the lower HASP price relative to the RTD price. In the IFM, excluding congestion and losses, the market participant is therefore able to supply (sell) and clear virtual demand (buy) at the same price. In real-time, excluding congestion and losses, the market participant is then able to liquidate (sell) virtual demand at the RTD price, while the intertie supply is liquidated (bought) at the HASP price. This apparent arbitrage activity results in the ISO net payment for energy MWh quantity bought by the ISO in RTD multiplied by the difference between the HASP price and the RTD price. The price at which the intertie supply is liquidated in HASP does not impact the successful arbitrage of the price differential. The successful implementation of the apparent arbitrage activity is only dependent on a RTD price higher than the HASP price, which has been common. See the table below for a numeric example.

Table 1 – Numeric Example of Bidding Strategy to Arbitrage HASP Price > RTD Price

	Day Ahead Market			HASP			Real Time Market		
	MW	Price	Revenue	MW	Price	Revenue	MW	Price	Revenue
Intertie Virtual Supply	100	$ 35.00	$ 3,500	100	$ (40.00)	$ (4,000)	N/A	N/A	N/A
Internal Virtual Demand	100	$ (35.00)	$ (3,500)	N/A	N/A	N/A	100	$ 45.00	$ 4,500
Total by Market			$ -			$ (4,000)			$ 4,500
Total for Bidding Strategy			$ 500						

However, this bidding pattern does not contribute to any physical commitment nor do they contribute to the convergence of conditions and prices between the day-ahead and real-time market. Rather these balanced and offsetting virtual positions contribute to economic inefficiencies depending on the HASP and RTD price differentials.

[4] Additional information and analysis can be found in Department of Market Monitoring (DMM) quarterly and annual reports, Market Performance and Planning Forum reports, and various presentations to stakeholders.

4.2 Intermediate Term Options from Prior Straw Proposal

In the following section, the ISO responds to stakeholder comments on each of the options from the revised straw proposal.

4.2.1 Settlement of Import/Exports based upon RTD

4.2.1.1 Pay as Bid

Under the Pay as Bid option, HASP timelines and bidding processes would remain unchanged; however, the HASP settlement for physical intertie transactions and liquidation of intertie virtual demand/supply would be eliminated. All intertie virtual demand/supply will be liquidated at the RTD price. The HASP process would determine indicative prices used to select which HASP intertie transactions that are accepted. Bids to export or reduce day-ahead imports would be accepted if the bid is below the indicative HASP price. Bids to export or reduce day-ahead imports would not be accepted if the bid is above the indicative HASP price. For incremental imports and reductions in day-ahead exports, the bids would be accepted if lower than the indicative price. The accepted physical transactions would be paid their bid price and difference between the bid price and the actual RTD price would be included as a credit/debit to the Real-Time Imbalance Energy Offset.

The ISO agrees with several stakeholders that this would be as step backwards from the LMP market design. The previous concerns with bidding behavior that takes into consideration a market participant's expectation of real-time pricing versus bidding the resource's marginal cost could impact market efficiency. However, during the pre-MRTU period, the Pay as Bid process did operate sufficiently and many of the concerns expressed during the Amendment 66 proceeding did not fully materialize. The ISO does agree with stakeholders that the long term redesign of the real-time market is the opportunity to fully address the issues that result from different settlement timing for internal and external resources.

4.2.1.2 Pay as Bid or Better

Under the Pay as Bid or Better option, HASP timelines and bidding processes would remain unchanged; however, the HASP settlement for physical intertie transactions and liquidation of intertie virtual demand/supply would be eliminated. All intertie virtual demand/supply would be liquidated at the RTD price. The HASP process would determine indicative prices used to select the HASP intertie transactions that are accepted. Bids to export or reduce day-ahead imports would be accepted if the bid is below the indicative HASP price. Bids to export or reduce day-ahead imports would not be accepted if the bid is above the indicative HASP price. For incremental imports and reductions in day-ahead exports, the bids would be accepted if lower than the indicative price. The accepted physical exports would pay the lower of their bid price or actual RTD price. The accepted physical imports would receive the higher of their bid price or actual RTD price. The difference between the bid price and the actual RTD price would be included as a charge to the Real-Time Imbalance Energy Offset.

Pay as Bid or Better received less stakeholder support than the Pay as Bid option. For similar reasons addressed above, the ISO does not believe that this option is a viable intermediate term option.

4.2.2 Negative Deviations to HASP Imports/Exports

In stakeholder comments, Powerex identified a concern with the treatment of HASP deviations. An intertie resource that sells energy in HASP, but fails to deliver is not subject to imbalance charges at the RTD price. Instead, failure to deliver on HASP commitments results only in (a)

non-payment of the HASP price (up to 10% of the participant's total HASP respective supply and demand volume per month); or (b) modest formula-based penalties for volumes beyond the first 10%. A non-performing HASP sale results in the ISO purchasing that energy from internal resources in the RTD. Failure to perform on HASP awards should be charged the RTD price, independent of the magnitude, frequency or reason for such failure.

In stakeholder comments, many stakeholders agreed that failure to perform on HASP awards should be charged the RTD price. The ISO has included this settlement change in the revised straw proposal.

4.2.3 Changes to the Allocation of Offset

The offset is currently allocated to all SCs based upon a pro rata share of their measured demand (i.e., metered load and exports) excluding the demand quantity for the valid and balanced portion of self-schedules related to transmission ownership rights in real-time and net measured demand of load following metered subsystems. In 2009, the ISO conducted a stakeholder process to determine whether modifications to the current design of the allocation of the Real-Time Imbalance Energy Offset were appropriate and necessary. At that time, no clear alternative could be identified because causal attribution to specific market activity was not clear. At the conclusion of the stakeholder process, the ISO did not fundamentally change the allocation to measured demand, but clarified that for SCs for MSS Operators that have elected Load following, the ISO will not assess any charges or make payments for the resulting non-zero differences recovered through the offset.

Given stakeholder support against implementing an intermediate design change and the recent operational changes that have driven improved HASP to RTD price convergence, the ISO agrees that stakeholder efforts should be prioritized on longer term design changes to the real-time market versus redesigning the allocation methodology of the Real-Time Imbalance Energy Offset. However, the ISO is proposing to add IFM imports that are subsequently reduced in HASP to be included in the allocation of the Real-Time Imbalance Energy Offset to address potential concerns with increased implicit virtual bidding.

4.2.4 Enable Convergence Bidding to converge HASP-RTD Prices

Currently, internal and intertie virtual bids are liquidated in HASP which results in balanced internal virtual demand/supply and external virtual supply/demand. These bids do nothing to converge HASP and RTD prices. However, if internal virtual demand/supply were treated as self schedules in HASP and liquidated in the subsequent RTD runs, then the internal convergence bids would be aligned with the pricing of internal generation/demand. Intertie virtual demand/supply would be liquidated at the HASP price and aligned with binding HASP physical import/export awards. Since virtual bids and physical bids are settled at the same time (HASP for external, RTD for internal), prices should converge across IFM, HASP and RTD based upon market participant bidding strategies.

Many stakeholders supported further ISO review of the Powerex proposal to address the premature liquidation of internal virtual supply and demand in HASP. The proposal does highlight the design issue discussed in Section 3 which supports the removal of convergence bidding at the interties under the current design. The ISO determined that holding internal virtual supply and demand until RTD would pose potential reliability risks given the importance of imports to the ISO meeting load. For example, assume there is net internal virtual supply, ISO operations would not be able to secure additional physical imports to replace the net internal virtual supply, but must only rely on internal generation. In periods of high load, ISO operations must have all internal and external resources available to meet ISO demand.

5 Price Inconsistency Caused by Intertie Constraints

In a parallel stakeholder initiative[5], the ISO has worked to resolve price inconsistency issues that are caused by enforcing the two intertie constraints implemented with convergence bidding. Under the current design, the ISO enforces two constraints at scheduling points: (1) net physical schedules across each scheduling point, ignoring the accepted virtual schedules to ensure that the physical schedules are within the established scheduling limit for that scheduling point and (2) physical and virtual imports net of physical and virtual exports must also be within established scheduling limits for that scheduling point. Since convergence bidding was implemented, the ISO has seen cases where physical export bids are clearing the market at LMPs that are inconsistent (higher) than the submitted bid for the scheduled resource. Market participants have raised concerns regarding the negative impact this pricing inconsistency may have on their settlement outcome.

Since the ISO is proposing to remove interties as eligible nodes for convergence bidding, this issue is no longer relevant.

6 Revised Straw Proposal

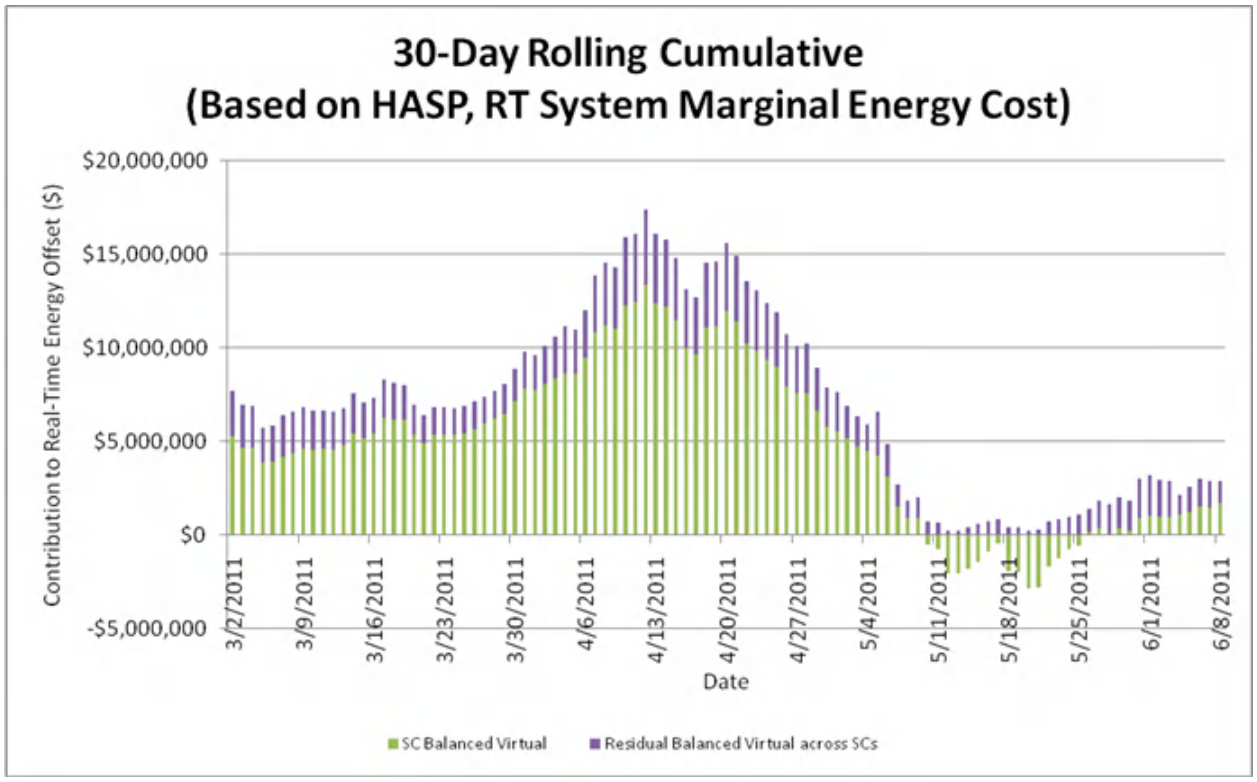
The revised straw proposal contains three elements:

- While the stakeholder process continues to address issues with convergence bidding on the interties, the ISO will retain the threshold for making an emergency filing of the proposed settlement rule;
- The ISO proposes to remove interties as eligible convergence bidding nodes under the current market design;
- The ISO proposes additional rules to deter implicit virtual bidding at the interties.

[5] Additional documentation for the Price Inconsistency Cause by Interties Constraints stakeholder initiative is available at http://www.caiso.com/2b6d/2b6dbef62e710.html.

6.1 Emergency Filing of Settlement Rule

Figure 2 – Impact of Bidding Strategy on Real-Time Energy Offset since March 2011



The cost impact of this bidding pattern to the Real-Time Energy Offset peaked in early April 2011 and has been steadily declining since. Figure 2 shows the relative impact of the balanced supply/demand position by individual SCs and the impact of offsetting virtual supply/demand position remaining in the market. The columns in the graph represent the 30 day cumulative dollar impact for each bucket. The impact of the balanced supply/demand position by individual SCs increased steadily until mid April and has then fallen significantly to approximately zero impact. The impact of offsetting virtual supply/demand positions remaining in the market has also followed a similar trend.

Figure 3 – MWh Quantity of Cleared Balanced Virtual Scheduling Coordinators

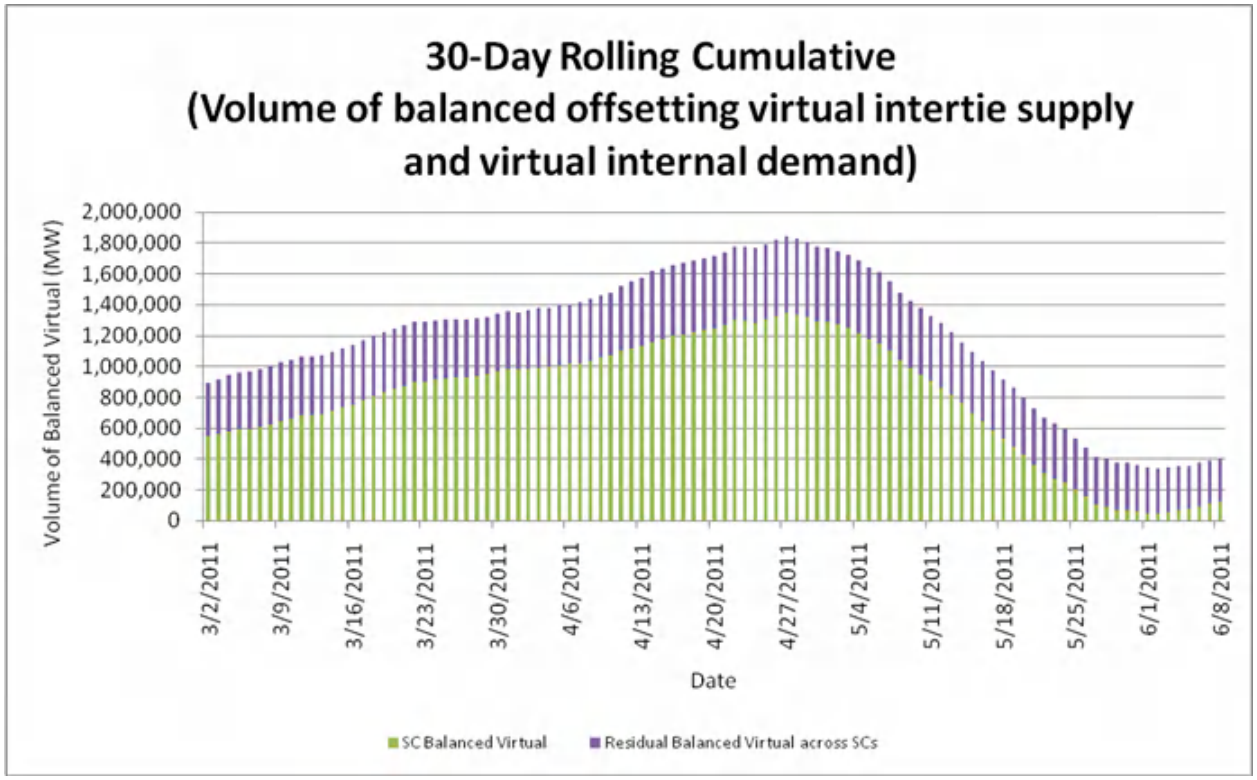


Figure 3 tracks the 30-day cumulative MWh of the bidding pattern. Since March 2011, the cumulative MWh balanced by a single SC rose steadily until late April and has declined since, but the decline has not been as significant as the dollar impact shown in Figure 2. Assuming price divergence returns to the levels seen in March and early April, the significant volume from the apparent attempts to price arbitrage will increase charges allocated through the Real-Time Imbalance Energy Offset. The ISO believes given the potential for significant volumes of balanced positions, it is important to provide market participants with a threshold amount that would result in an emergency filing of the proposed settlement rule.

6.1.1 Threshold for Emergency Filing

As seen in Figure 2, the ISO has developed internal metrics to determine the impact of the arbitrage bidding activity outlined in Table 1. The ISO will establish the threshold for an emergency filing if the 30-day rolling cumulative quantity real-time imbalance energy offset attributable to balancing and offsetting virtual intertie positions and virtual internal positions exceeds $20 million based on the differential of the system marginal energy component of the HASP and RTD prices. Therefore, if the sum of the SC Balanced Virtual and the Residual Balanced Virtual across SCs in Figure 2 reaches $20 million, the threshold would trigger an emergency action to implement the proposed settlement rule.

6.1.2 Settlement Rule

If the threshold described in the previous section is reached, the ISO will make an emergency filing at FERC to implement the settlement rule proposed in the straw proposal and described below. The proposed settlement rule addresses the systematic arbitrage price differentials between HASP and RTD. While the ISO has historically experienced higher prices in RTD relative to HASP, the ISO is proposing a settlement rule which eliminates price arbitrage when

the HASP price is less than the RTD price and when the RTD price is greater than the HASP price. The settlement rule can result in a charge or credit which results in any difference between HASP and RTD netting to zero for a SC with a balanced position.

For each SC, the settlement rule would result in a charge or credit based upon the difference between the System Marginal Energy Cost (SMEC) in HASP and RTD for the SC's balanced supply/demand position at the interties and internal to the ISO. When the RTD price is greater than the HASP price, the balanced position will be based upon internal virtual demand and imports. When the HASP price is greater than the RTD price, the balanced position will be based upon internal virtual supply and exports.

The calculation of the settlement rule is as follows:

Equation 1 calculates the internal net position: Pint = Vd – Vs

Equation 2 calculates the external net position: Ptie = Vs + Ri – Vd – Re

Equation 3 determines the balanced MW quantity:

If Pint * Ptie > 0

Then If Pint > 0

Then Q = MIN (Pint, Ptie)

Else Q = MAX (Pint, Ptie)

Else Q = 0

Equation 4 calculates the settlement amount: S = Q * (RTD SMEC – HASP SMEC)

Where:

Pint is the net position internal to the ISO

Ptie is the net position at the interties

Vd is virtual demand

Vs is virtual supply

Ri is the quantity of day ahead physical imports which have been reduced in HASP

Re is the quantity of day ahead physical exports which have been reduced in HASP

Q is the quantity of MW of the balanced internal/external supply and demand

S is the settlement amount charged/credited to Scheduling Coordinator

The following are numeric examples:

Table 2 – Settlement Rule for Balanced Position to Exploit HASP < RTD

HASP < RTD Strategy	Example 1	Example 2	Example 3	Example 4	Example 5	Example 6	Example 7	Example 8	Example 9	Example 10
HASP SEMC	$ 30.00	$ 30.00	$ 30.00	$ 30.00	$ 30.00	$ 35.00	$ 35.00	$ 35.00	$ 35.00	$ 35.00
RTD SEMC	$ 35.00	$ 35.00	$ 35.00	$ 35.00	$ 35.00	$ 30.00	$ 30.00	$ 30.00	$ 30.00	$ 30.00
Internal Virtual Demand (MW)	100	100	100	100	100	100	100	100	100	100
Intertie Virtual Supply (MW)	50	100	50	100	150	50	100	50	100	150
DA Import - HASP Import (MW)	0	0	50	50	50	0	0	50	50	50
Balanced Amount (MW)	50	100	100	100	100	50	100	100	100	100
Charge (Credit) to Entity	$ 250.00	$ 500.00	$ 500.00	$ 500.00	$ 500.00	$ (250.00)	$ (500.00)	$ (500.00)	$ (500.00)	$ (500.00)

Table 3 – Settlement Rule for Balanced Position to Exploit HASP > RTD

HASP > RTD Strategy	Example 1	Example 2	Example 3	Example 4	Example 5	Example 6	Example 7	Example 8	Example 9	Example 10
HASP SEMC	$ 35.00	$ 35.00	$ 35.00	$ 35.00	$ 35.00	$ 30.00	$ 30.00	$ 30.00	$ 30.00	$ 30.00
RTD SEMC	$ 30.00	$ 30.00	$ 30.00	$ 30.00	$ 30.00	$ 35.00	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Internal Virtual Supply (MW)	100	100	100	100	100	100	100	100	100	100
Intertie Virtual Demand (MW)	50	100	50	100	150	50	100	50	100	150
DA Export - HASP Export (MW)	0	0	50	50	50	0	0	50	50	50
Balanced Amount (MW)	50	100	100	100	100	50	100	100	100	100
Charge (Credit) to Entity	$ 250.00	$ 500.00	$ 500.00	$ 500.00	$ 500.00	$ (250.00)	$ (500.00)	$ (500.00)	$ (500.00)	$ (500.00)

The charge/credit from the proposed settlement rule will be applied to the Real-Time Imbalance Energy Offset. The allocation of the Real-Time Imbalance Energy Offset to Measured Demand will remain unchanged.

6.2 Remove Convergence Bidding on Interties from Current Design

The ISO proposes to not allow interties to be eligible nodes for convergence bidding under the current market design. In evaluating all options to address both the Real-Time Imbalance Energy Offset issue and the Price Inconsistency Caused by Intertie Constraints issue, the ISO believes that removing convergence bidding at the interties from the current market design is the most effective way to resolve both issues. The ISO believes the benefits of continuing to allow convergence bidding at the interties do not outweigh the current issues identified by market participants. The ISO does recognize that another potential option is to make no changes to the market design, but this would require market participants to accept the current issues identified with the existing market design.

Stakeholder comments on the proposed solutions vetted through both stakeholder initiatives has not shown broad support for any of the options. In addition, stakeholders and the ISO have not been able to identify alternative options that address identified issues without creating new market efficiency issues or reliability concerns.

6.3 Measures to Address Potential Implicit Virtual Bidding

A prior justification for allowing convergence bidding on the interties was to ensure implicit virtual bidding was more costly than convergence bidding. Implicit virtual bidding is the use of physical imports/exports to arbitrage price differences between IFM and HASP with no intent to

flow energy. As discussed, market participants can bid to arbitrage price differentials between HASP and RTD using physical supply/demand on an intertie and reversing the IFM position in HASP. The ISO implemented additional settlement rules as part of the convergence bidding design[6] to address concerns over implicit virtual bidding on the interties. The ISO is proposing additional rules to minimize the impact of implicit virtual bidding.

6.3.1 Deviations from HASP Schedules Settled at RTD price

A non-performing HASP awarded import results in the ISO purchasing that energy from internal resources in the RTD. A non-performing HASP awarded export results in the ISO reducing energy for internal resources in RTD. Both actions can result in divergence between HASP prices and RTD prices. The ISO proposes that failure to perform on HASP awards will be charged the RTD price, independent of the magnitude, frequency or reason for such failure. The HASP Schedules Decline Charge as outline in tariff section 11.31 will remain unchanged.

6.3.2 HASP Import Reductions Included in Real-Time Imbalance Energy Offset Allocation

Currently, the Real-Time Imbalance Energy Offset is allocated to measured demand which includes metered demand and exports. If a market participant had an IFM import schedule and wanted to reduce the MW quantity that would flow, the market participant has two options. The market participant can submit an export bid in HASP, and if the export bid clears HASP the market participant is subject to the Real-Time Imbalance Energy Offset allocation. However, if the market participant submitted a HASP decrement bid to the IFM import schedule, the market participant would not be subject to the Real-Time Imbalance Energy Offset. Since both transactions result in the same MW flow of energy, the ISO proposes to include the MW quantity of IFM imports reduced in HASP in the allocation of the Real-Time Imbalance Energy Offset. For example, if a market participant has a 100MW IFM import and successfully cleared a 30MW decrement bid in HASP, 30MW would be included in the allocation of the Real-Time Imbalance Energy Offset.

7 Next Steps

The ISO will discuss the Revised Straw Proposal with stakeholders during a teleconference to be held on June 17, 2011. The ISO is seeking comments on the proposal outlined in Section 6. Stakeholders should submit written comments by June 24, 2011 to RToffset@caiso.com.

[6] Additional documentation is available at the e-Tagging Timing Requirements stakeholder initiative at http://www.caiso.com/244c/244cabfb36550.html.